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A New Species of *Strobilanthes* Blume (Acanthaceae) from Thailand

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ABSTRACT.– A species new to science, belonging to *Strobilanthes* from Thailand is described. *Strobilanthes sirindhorniae* Kladwong & Chantar., sp. nov. is found on limestone in northern Thailand. It is morphologically similar to *S. maxwellii* J.R.I.Wood and *S. rosea* Nees. A comparison table with similar and closely related species and a distribution map, and an illustration of *S. sirindhorniae* sp. nov. are provided.

KEYWORDS: endemic, floristic, taxonomy

INTRODUCTION

The Acanthaceae is a medicinally important family comprising approximately 5,000 species in 208 genera, predominantly distributed throughout the tropical regions of the Americas, Europe, Africa, and Asia (Christenhusz et al., 2017; POWO, 2024, WFO, 2024). Several species within the family have been traditionally utilized for medicinal purposes. For example, the leaves of *Acanthus ilicifolius* L. are widely employed in ethnobotanical and ethnopharmaceutical practices, particularly Thai, Chinese, and Indian traditional medicine (Wöstmann and Liebezeit, 2008). The inflorescences of *Strobilanthes auriculata* Nees are used to enhance immunity against cardiovascular diseases (Ningombam et al., 2014). Furthermore, several important phytochemical compounds including glycosides, flavonoids, benzenoids, phenolic compounds, naphthoquinones, and triterpenoids have been reported from members of the Acanthaceae (Awan and Aslam, 2014).

Traditionally, the family Acanthaceae has been divided into several tribes based on morphological, corolla aestivation, palynological and molecular evidence (Scotland and Vollesen, 2000; Manzitto-Tripp et al., 2022). The genus *Strobilanthes* Blume was historically classified within the subtribe Ruelliinae based on key morphological features such as left-contorted aestivation, the presence of a filament curtain, and jaculators (Watson and Dallwitz, 1992; Scotland and Vollesen, 2000; Olmstead, 2005; Kladwong and Chantaranothai, 2022a). However, more recent phylogenetic studies have led to the reclassification of *Strobilanthes* as the sole genus of the newly circumscribed subtribe Strobilanthinae (Manzitto-Tripp et al., 2022). Currently, approximately 454 species are recognized within *Strobilanthes*, with the majority distributed throughout the tropical and subtropical regions of Asia (Mabberley, 2008; Christenhusz et al., 2017; POWO, 2024; WFO, 2024). In Thailand, ongoing taxonomic revisionary work by the authors has resulted in the documentation of species characterized by capitate and paniculate inflorescences (Kladwong and Chantaranothai, 2022b, 2023, 2024), highlighting the morphological diversity within the genus.

During field observations and examination of unidentified specimens of *Strobilanthes* from Thailand, four specimens collected from Tha Song Yang District, Tak Province, were found to have glabrous leaves, cordate or subcordate at the lamina base. The inflorescences exhibited sticky glandular hairs, and the capsules contained two seeds. These features differ from those of all known *Strobilanthes*; therefore, they are described here as a new species, *S. sirindhorniae*. This species will be included in the treatment of *Strobilanthes* for the Flora of Thailand account.

MATERIALS AND METHODS

Morphological descriptions were derived primarily from measurements of dried herbarium specimens, supplemented by observations from photographs of mature, living plants collected during fieldwork. Comparative morphological studies involved examination of herbarium specimens and digital images of the species most closely related to the newly described taxon, sourced from the following herbaria: BKF, CAS, CMUB, E, GZU, K, K-W, L, and QBG. Pollen morphology was assessed by measuring 10 grains using both light microscopy (LM; Olympus CH30) and scanning electron microscope (SEM; LEO1450VP), to document intraspecific variation. Plant morphology follows the criteria and terminology outlined in the Kew Plant Glossary (Beentje, 2016). Pollen characteristics adhere to the guidelines and terminology established by Carine and Scotland (1998). Conser-

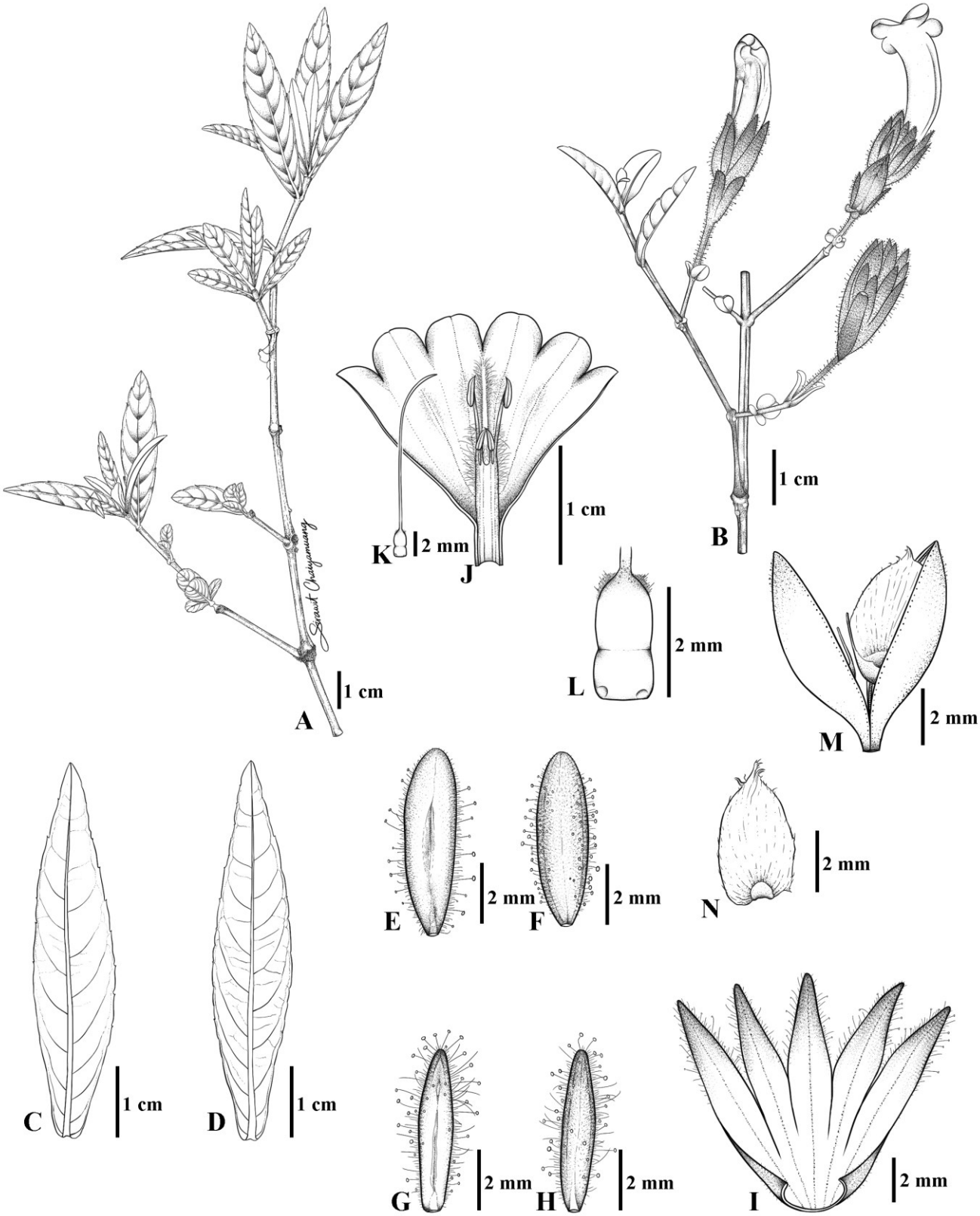

FIGURE 1. *Strobilanthes sirindhorniae* Kladwong & Chantar., sp. nov. **A.** stem and leaves; **B.** flowering branches and inflorescences; **C.** adaxial surface of mature leaf; **D.** abaxial surface of mature leaf; **E.** adaxial surface of bract; **F.** abaxial surface of bract; **G.** adaxial surface of bracteole; **H.** abaxial surface of bracteole; **I.** calyx; **J.** corolla and stamens; **K.** gynoecium; **L.** ovary; **M.** fruit; **N.** immature seed. Drawn from *Kladwong et al. 563* (KKU) by Sirawit Chaiyamuang.

FIGURE 2. *Strobilanthes sirindhorniae* Kladwong & Chantar., sp. nov. **A.** habit, stem and leaves; **B.** flowering branches and inflorescences; **C.** abaxial surface of mature leaf; **D.** adaxial surface of mature leaf; **E.** abaxial surface of nearly falling leaf; **F.** adaxial surface of nearly falling leaf; **G.** abaxial surface of bract; **H.** adaxial surface of bract; **I.** abaxial surface of bracteole; **J.** adaxial surface of bracteole; **K.** calyx; **L.** corolla bud; **M.** corolla at anthesis; **N.** stamens and corolla tube; **O.** gynoecium; **P.** ovary; **Q.** fruit; **R.** immature seed. Photos by Naphat Modsang.

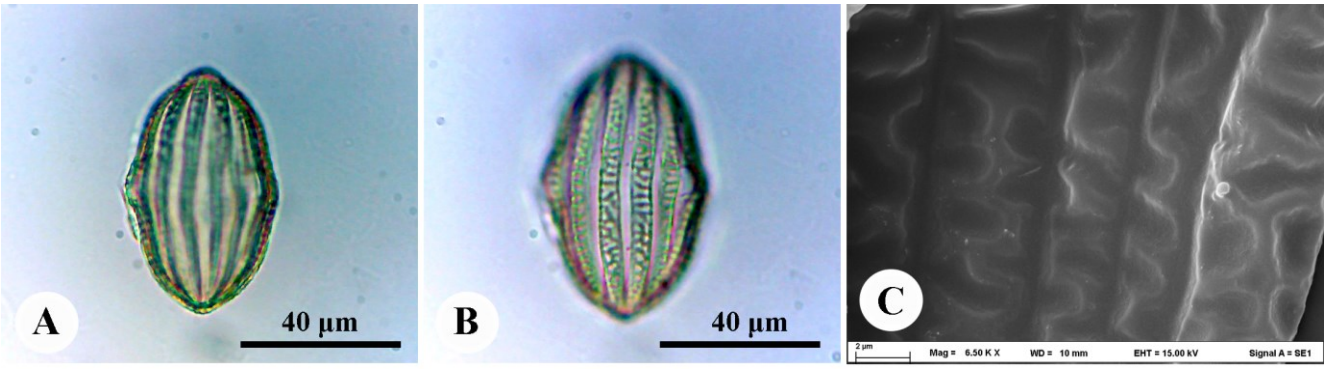

FIGURE 3. Pollen of *Strobilanthes sirindhorniae* Kladwong & Chantar., sp. nov. **A, B.** LM micrographs of pollen in equatorial view; **C.** SEM micrograph of exine sculpturing.

vation status was evaluated following the IUCN Red List Categories and Criteria (IUCN, 2022), with the Extent of Occurrence (EOO) and Area of Occupancy (AOO) calculated using GeoCAT (Bachman et al., 2011).

TAXONOMIC TREATMENT

Strobilanthes sirindhorniae Kladwong & Chantar., sp. nov.

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(Figs 1–3)

Strobilanthes sirindhorniae sp. nov. resembles *S. maxwellii* J.R.I.Wood and *S. rosea*. It differs from both in having its glabrous leaves, a cordate or subcordate lamina base and capsules containing two seeds (Table 1).

Type.– Thailand. Tak: Tha Song Yang, Thi [Thee] Mo Bo Waterfall, 181 m alt., 6 Mar. 2019, *Kaitongsuk, Suddee, Rueangrea, Kiewbang & Hamrat 167* (holotype BKF [SN237476!]).

Perennial herbs or small shrubs up to 50 cm tall, isophyllous or sometimes slightly anisophyllous. *Stems* terete and stout or 4-angled and sulcate when young; bark greyish or reddish brown on branches, glabrous but with white pustules and sometimes with white tomentose hairs. *Leaves* oblong-lanceolate or broadly elliptic or obovate, 0.5–7 by 0.2–2 cm; apex acute or obtuse; base cordate or subcordate, glabrous on both surfaces, greenish on both surfaces with yellowish green and sometimes dark red midvein, prominent on both surfaces; lateral veins 3–6 pairs, not prominent; margin slightly crenate-dentate; cystoliths small, linear; petiole sessile or subsessile. *Inflorescences* terminal, consisting of a single spike; spikes 1–2 cm long; peduncle 0.8–1 cm long, sticky glandular-puberulous to pilose; bracts oblong or oblong-oblanceolate, 5–8 by 1.5–2.5 mm, persistent, sticky glandular-puberulous to pilose outside, apex obtuse or acute, greenish with reddish midvein, margin entire and subglabrous or ciliate; bracteoles linear, 5–8 by ca 1 mm, persistent, sticky glandular-puberulous to pilose, greenish and with reddish midvein. *Pedicel* absent. *Calyx* 6–10 mm long, subequal; lobes linear-oblanceolate, ca 2 mm wide, hairy and sparsely glandular-puberulous outside, apex acute. *Corolla* purple, 2–2.5 cm long, straight, glabrous outsides; tube whitish yellow, cylindrical at base for 4–6 mm long; mouth 6–8 mm wide; lobes pale purple, ovate, 4–6 by ca 4 mm, apex subobtuse. *Stamens* 4, included; short filaments ca 2 mm long, straight; long filaments 4–5 mm long, straight, all filaments glabrous, connective apiculate at apex; anther oblong, 2–2.5 mm long, yellowish white; pollen 3-colporate, prolate in equatorial view, circular in polar view, polar axis 52.5–72.5 µm, equatorial diameter 27.5–47.7 µm; exine ca 14-ribbed with ladder-like markings. *Ovary* gland-tipped hairy at apex; style ca 2 cm long, sparsely gland-tipped hairy. *Capsule* fusiform, 9–10 by ca 3 mm, glandular hairy at apex. *Seeds* 2 with 2 non-developing ovules, ovate in outline, 2.5–3 by ca 2.5 mm, hairy.

Distribution, habitat and phenology.– *Strobilanthes sirindhorniae* sp. nov. is a limestone-endemic species restricted to Thailand, occurring on limestone bedrock in open scrubland, exposed gravelly areas, and within mixed deciduous forests. It typically inhabits well-drained, rocky substrates on steep limestone slopes at elevations of 181–200 m, growing under open, sun-exposed conditions. Flowering and fruiting occur from December to March (Figs 4, 5).

Etymology.– The specific epithet *sirindhorniae* honours Her Royal Highness Princess Maha Chakri Sirindhorn for her outstanding contributions to plant conservation in Thailand.

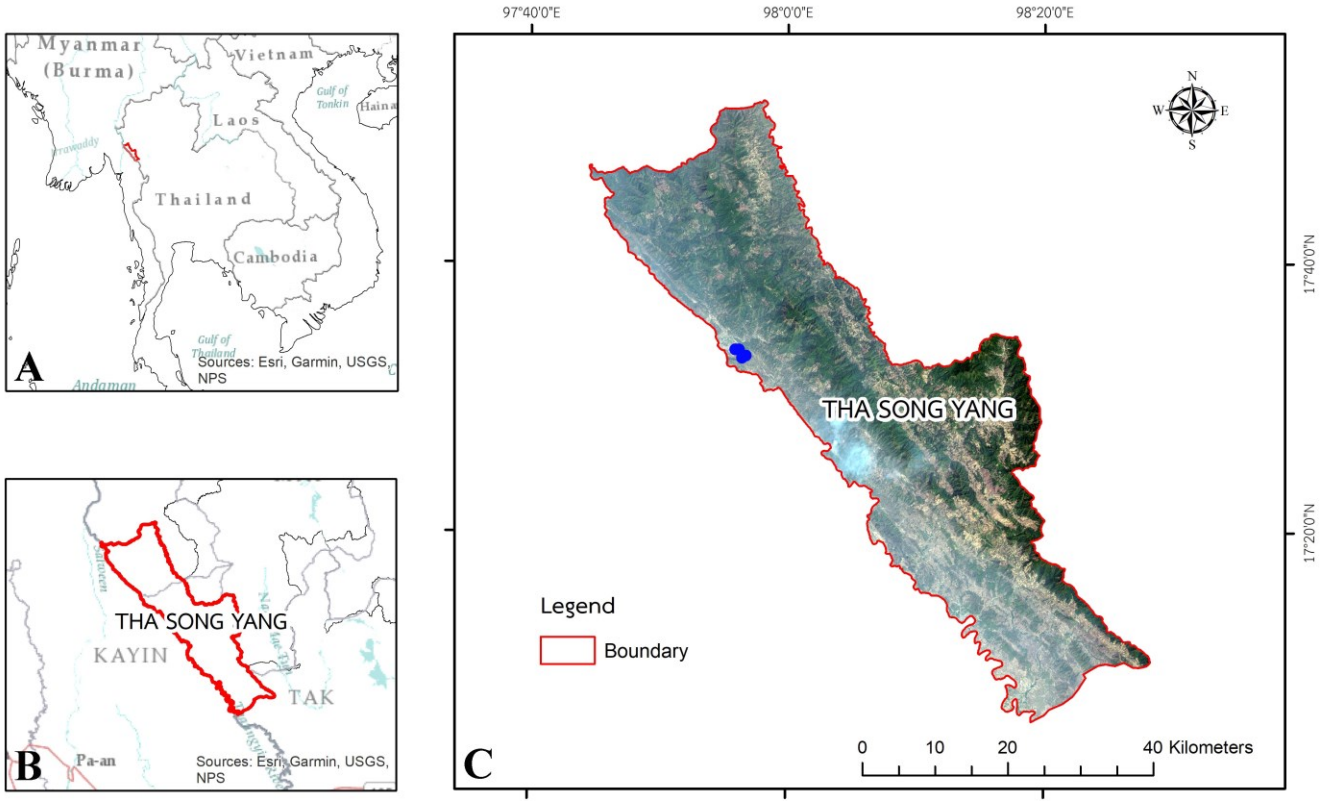

FIGURE 4. Distribution of *Strobilanthes sirindhorniae* Kladwong & Chantar., sp. nov. **A.** The Mainland Southeast Asia; **B.** Tha Song Yang District in Tak Province of Thailand; **C.** four collecting sites of *S. sirindhorniae* (blue circles). Created by Nattakit Saisuwan.

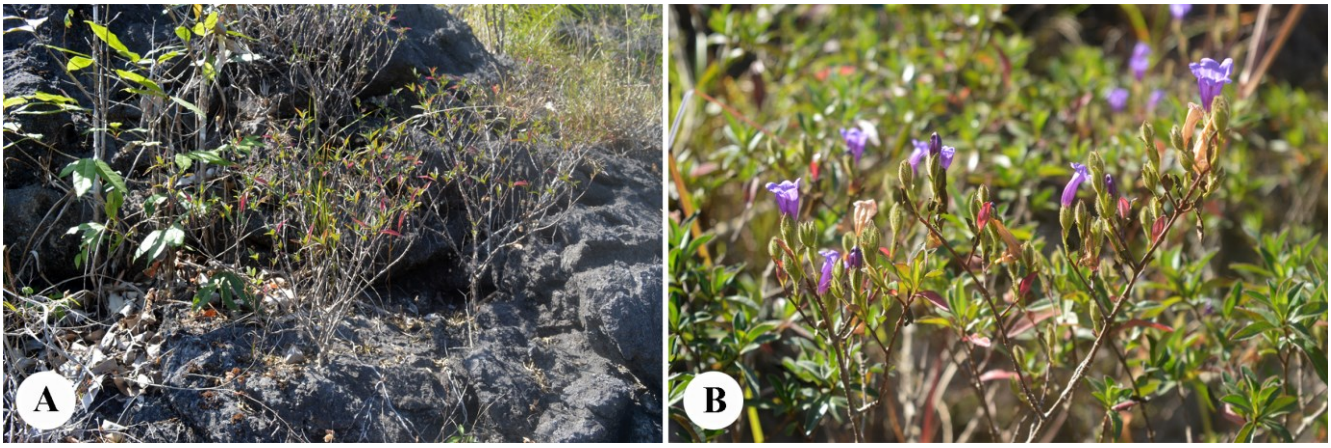

FIGURE 5. *Strobilanthes sirindhorniae* Kladwong & Chantar., sp. nov. **A.** habitat; **B.** habit and flowering branches. Photos by Pornchai Kladwong.

Vernacular.– Hom Sirindhorn (ฮ่อมสิรินธร).

Preliminary conservation status.– *Strobilanthes sirindhorniae* sp. nov. has an Extent of Occurrence (EOO) of 2.328 km² and an Area of Occupancy (AOO) of 16.000 km². Field observations indicate that *S. sirindhorniae* sp. nov. is locally common and gregarious across four collecting sites. However, its habitat is threatened by land excavation, livestock farming, droughts and human-induced fires. Therefore, we propose that *S. sirindhorniae* sp. nov. is Critically Endangered (CR) under criterion B1ab(iii) following IUCN (2022) guidelines.

Additional specimens examined.– THAILAND: NORTHERN Tak [Tha Song Yang, Khao Hua Mot Noi, 5 km before Ban Tha Song Yang, 23 Dec. 2010, *Suksathan* et al. *5364* (L); ibid., Ban Tha Song Yang, 200 m alt., 10 Dec. 2024, *Modsang 1* (KKU); ibid., 25 Jan. 2025, *Kladwong* et al. *563* (KKU)].

TABLE 1. Morphological differences between *S. sirindhorniae* sp. nov. and similar species.

Characters	*S. maxwellii*	*S. rosea*	*S. sirindhorniae* sp. nov.
Leaf surface	puberulent with scattered pustules (abaxial)	sparsely scabrid (adaxial), tomentose (abaxial)	glabrous
Lamina base	attenuate or cuneate	attenuate	cordate or subcordate
Capsule	4-seeded, glabrous	8-seeded, hispid at apex	2-seeded, glandular hairy at apex
Stamens	four	two	four

Note.– *Strobilanthes sirindhorniae* sp. nov. closely resembles *S. maxwellii* (Wood and Scotland, 2003) and *S. rosea* (Nees, 1832) in having pustulate stems and sticky glandular hairs on the spicate inflorescences. It is distinguished by its glabrous leaves (vs. puberulent with scattered pustules in *S. maxwellii* and sparsely scabrid adaxially, tomentose abaxially in *S. rosea*), a cordate or subcordate lamina base (vs. attenuate or cuneate), and capsules containing two seeds (vs. four seeds in *S. maxwellii* and eight seeds in *S. rosea*). Additionally, *S. sirindhorniae* sp. nov. differs from *S. maxwellii* in having glandular hairy capsules (vs. glabrous) and from *S. rosea* in having four stamens (vs. two) (Table 1). Pollen grains of *S. sirindhorniae* sp. nov. exhibit morphological characteristics most similar to the *S. cusia* type as defined by Wang and Blackmore (2003), which corresponds to Type 4 of Carine and Scotland (1998) and Type 4 of Hu et al. (2011). This pollen type is characterized by ektexine ribs, each bearing a continuous central raised strip.

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